

REMARKS

Claims 1-36 are pending in the present application. In the Office Action, the Examiner objected to claims 4-25 and 29-36 because of a number of alleged informalities. The alleged informalities are addressed individually below.

With regard to claim 4, Applicant respectfully submits that the "H" superscript is defined in the specification to indicate a conjugate transpose function. See Patent Application, page 6, ll. 8-18. Thus, Applicant respectfully submits that claim 4 is clear and requests that the Examiner's objection to claim 4 be withdrawn.

With regard to claim 8, Applicant has amended the claim to clarify the claim language. In particular, claim 8 has been amended to set forth "beamforming applied to the stream." The claim has in no way been narrowed by virtue of this amendment and so this amendment should not be interpreted as narrowing the claimed invention for purposes of any determination under the doctrine of equivalents. The Examiner indicated that the phrase "stream of information" should be replaced with "stream of incoming information." Applicant respectfully disagrees and submits that the phrase "stream of information symbols that are to be transmitted" clearly sets forth the scope of the claim. The Examiner also alleged that the claim is indefinite because one is unable to determine an order of steps in the method. Applicant respectfully disagrees and notes that there is no statutory requirement that the order of steps in a method be set forth. Applicant respectfully requests that the Examiner's objections to claim 8 be withdrawn.

With regard to claim 18, Applicant has amended the claim to clarify the claim language. In particular, claim 18 has been amended to set forth "the fixed time delay" and to correct certain typographical errors. The claim has in no way been narrowed by virtue of these amendments and so they should not be interpreted as narrowing the claimed invention for purposes of any

determination under the doctrine of equivalents. Applicant respectfully requests that the Examiner's objection to claim 18 be withdrawn.

With regard to claim 19, Applicant has amended the claim to clarify the claim language. In particular, claim 19 has been amended to set forth "the fixed time delay" and to correct a typographical error. The claim has in no way been narrowed by virtue of these amendments and so they should not be interpreted as narrowing the claimed invention for purposes of any determination under the doctrine of equivalents. Applicant respectfully requests that the Examiner's objection to claim 19 be withdrawn.

With regard to claims 21-23, the Examiner alleges that the first and second signals are added rather than subtracted because of a negative sign in the data. Applicant has amended this claim to set forth "combining the first and second signals." The claims have in no way been narrowed by virtue of these amendments and so they should not be interpreted as narrowing the claimed invention for purposes of any determination under the doctrine of equivalents. Applicant respectfully requests that the Examiner's objections to claims 21-23 be withdrawn.

With regard to claim 24, Applicant has amended this claim to set forth "the at least two component signals." The claim has in no way been narrowed by virtue of this amendment and so it should not be interpreted as narrowing the claimed invention for purposes of any determination under the doctrine of equivalents. Applicant respectfully requests that the Examiner's objection to claim 24 be withdrawn.

With regard to claim 29, Applicant has amended this claim to set forth "antenna." The claim has in no way been narrowed by virtue of this amendment and so it should not be interpreted as narrowing the claimed invention for purposes of any determination under the

doctrine of equivalents. Applicant respectfully requests that the Examiner's objection to claim 29 be withdrawn.

In the Office Action, claims 8, 9, 14, and 15 were rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by Harrison (U.S. Patent No. 6,154,485). The Examiner's rejections are respectfully traversed.

Harrison is concerned with receiving signals using combined orthogonal transmit diversity and adaptive array techniques. Harrison describes a coefficient  $\alpha$  that may allow a base transmitter to smoothly transition between orthogonal transmit diversity mode and adaptive array mode. This smooth transition may allow the base transmitter to smoothly disable the adaptive array mode in proportion to the degradation of the quality of feedback data from a receiver. See Harrison, col. 8, ll. 23-35.

However, Harrison does not describe or suggest determining a code correlation parameter ( $\lambda$ ) based on an auto-correlation of a channel estimate, as set forth in independent claim 8. Applicant notes that auto-correlation is a well-known mathematical function. See, e.g., Bracewell, "The Autocorrelation Function," *The Fourier Transform and Its Applications*, 3rd ed. New York: McGraw-Hill, pp. 40-45, 1999. For at least this reason, Applicants respectfully submit that claim 8, and claims 9, 14, and 15 depending therefrom, are not anticipated by Harrison. Applicants request that the Examiner's rejections of claims 8, 9, 14, and 15 under 35 U.S.C. § 102(e) be withdrawn.

In the Office Action, claims 1, 2, and 4-6 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Harrison. Claims 3, 7, 20, 29-31, and 35-36 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Harrison in view of Alamouti (U.S. Patent No. 6,185,258). Claim 10 was rejected under 35 U.S.C. § 103(a) as allegedly being

unpatentable over Harrison in view of Dabak, et al (U.S. Patent No. 6,594,473). Claim 34 was rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Harrison in view of Alamouti and in further view of Rice (U.S. Patent Application Publication No. 2002/0172260). The Examiner's rejections are respectfully traversed.

To establish a *prima facie* case of obviousness, the prior art reference (or references when combined) must teach or suggest all the claim limitations. As discussed above, Harrison describes a coefficient  $\alpha$  that may allow a base transmitter to smoothly transition between orthogonal transmit diversity mode and adaptive array mode. However, Harrison is completely silent with regard to generating a transformation matrix  $L$  based on an auto-correlation of a channel estimate, as set forth in independent claims 1 and 4. Moreover, as admitted by the Examiner, Harrison does not explicitly disclose an orthogonal code matrix, as set forth in independent claims 1 and 4. Harrison is also completely silent with regard to determining a code correlation parameter ( $\lambda$ ) based on an auto-correlation of a channel estimate, as set forth in independent claim 8. Claims 10 and 20 depend from independent claim 8.

The Examiner relies upon Alamouti to describe generation of an orthogonal code matrix. The Examiner also relies upon Dabak to describe a complex beamforming weight parameter having a magnitude and a phase, and Rice to describe using a look up table. However, these secondary references fail to remedy the fundamental deficiencies of the primary reference. Moreover, none of the cited references provide any suggestion or motivation to modify the prior art to arrive at Applicants claimed invention. For at least the aforementioned reasons, Applicants respectfully submit that the present invention is not obvious over Harrison, Alamouti, Dabak, or Rice either alone or in combination. Applicants request that the Examiner's rejections of claims 1-7, 10, 20, 29-31, and 34-36 under 35 U.S.C. 103(a) be withdrawn.

In the Office Action, the Examiner indicated that claims 11-13, 16-19, 21-28, and 32-33 contain allowable subject matter, but the Examiner objected to these claims as being dependent upon a rejected base claim. Claims 11, 16, and 32 have been rewritten in independent form including all the limitations of the base claim and any intervening claims. Claims 12-13, 17-19, and 33 depend from the rewritten independent claims 11, 16, or 32. Contrary to the Examiner's allegation, claims 21-28 are not dependent upon any rejected base claims. Accordingly, Applicant respectfully submits that claims 11-13, 16-19, 21-28, and 32-33 are allowable and request that the Examiner's objections be withdrawn.

For the aforementioned reasons, it is respectfully submitted that all claims pending in the present application are in condition for allowance. The Examiner is invited to contact the undersigned at (713) 934-4052 with any questions, comments or suggestions relating to the referenced patent application.

Respectfully submitted,

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